Commonwealth Edison
LaSalle County Nuclear Station
2601 N. 21st. Rd.
Marseilles, Illinois 61341
Telephone 815/357-6761

May 15, 1992

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D.C. 20555

Dear Sir:

Licensee Event Report #92-001-00, Docket #050-374 is being submitted to your office in accordance with 10CFR50.73 (a) (2) (iv).

W R. Hewitt

G. J. Diederich
Station Manager
LaSalle County Station

GJD/SK/tsh

Enclosure

cc: Nuclear Licensing Administrator
NRC Resident Inspector
NRC Region III Administrator
INPO - Records Center
IDNS Resident Inspector

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1)	Docket Number (2)	Page (3)
LaSalle County Station Unit 2	0 5 0 0 0 3 7 4	1 of 0 4

Title (4)

Unit 2 Manual Scram Due To Bypass Valve Cycling For Unknown Reasons

Event Date (5)			LER Number (6)			Report Date (7)			Other Facilities Involved (8)	
Month	Day	Year	Year	Sequential Number	Revision Number	Month	Day	Year	Facility Names	Docket Number(s)
										0 5 0 0 0
0 4	1 5	9 2	9 2	0 0 4	0 0	0 5	1 5	9 2		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)					
1		___ 20.402(b)	___ 20.405(c)	X 50.73(a)(2)(iv)	___ 73.71(b)		
POWER LEVEL (10)	0 1 8	___ 20.405(a)(1)(i)	___ 50.36(c)(1)	___ 50.73(a)(2)(v)	___ 73.71(c)		
		___ 20.405(a)(1)(ii)	___ 50.36(c)(2)	___ 50.73(a)(2)(vii)	___ Other (Specify in Abstract below and in Text)		
		___ 20.405(a)(1)(iii)	___ 50.73(a)(2)(i)	___ 50.73(a)(2)(viii)(A)			
		___ 20.405(a)(1)(iv)	___ 50.73(a)(2)(ii)	___ 50.73(a)(2)(viii)(B)			
		___ 20.405(a)(1)(v)	___ 50.73(a)(2)(iii)	___ 50.73(a)(2)(x)			

LICENSEE CONTACT FOR THIS LER (12)

Name	TELEPHONE NUMBER AREA CODE
S. Kleinhardt, Technical Staff Engineer, Ext. 2245	8 1 5 3 5 7 - 6 7 6 1

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS
X	T G			Y					

SUPPLEMENTAL REPORT EXPECTED (14)		Expected Submission Date (15)	Month	Day	Year
___ Yes (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e, approximately fifteen single-space typewritten lines) (16)

At 1510 hours, on April 15, 1992, with Unit 2 in Operational Condition One (Run) at 18% power (180 MWe), the reactor was manually scrammed as a conservative measure due to Main Turbine Bypass Valve cycling. Minor reactor pressure oscillations occurred when the Main Turbine Control Valves repositioned in response to an Electro-Hydraulic Control (EHC) System speed signal anomaly. All equipment responded as designed. All Reactor Control Rods inserted, three of the Main Turbine Bypass Valves and no Safety Relief Valves cycled due to the low power level.

The root cause of the speed signal anomaly has not been determined. The manual scram was initiated because of the excessive bypass valve cycling. An analysis of the events by Commonwealth Edison and the General Electric Company indicates that the erratic primary speed signal resulted in the EHC System switching from Load and Pressure Control to Speed Control and back again. The pressure increases and bypass valve cycling were responses to proper EHC Control System demand signals.

Insufficient operational data was obtained during the event and troubleshooting performed subsequent to the event did not result in a determination of the specific cause of the speed signal anomaly. The speed circuits, as well as the outputs of the low value gate and bypass valve amplifier will be monitored by recorders set to trigger on recurrence of the spurious signal throughout the fuel cycle.

This event is reportable pursuant to the requirements of 10CFR50.73(a) (2) (iv) due to a manual actuation of the Reactor Protection System.

PLANT AND SYSTEM IDENTIFICATION

General Electric - Boiling Water Reactor

Energy Industry Identification System (EIIS) codes are identified in the text as [XX].

A. CONDITION PRIOR TO EVENT

Unit(s): 2 Event Date: 04/15/92 Event Time: 1510 Hours

Reactor Mode(s): 1 Mode(s) Name: Run Power Level(s): 18%

B. DESCRIPTION OF EVENT

At 1510 hours, on April 15, 1992, with Unit 2 in Operational Condition One (Run) at 18% power (180 MWe), the reactor was manually scrammed as a conservative measure due to Main Turbine Bypass Valve (EHC) [TG] cycling. Reactor pressure oscillations from [illegible] to 940# occurred when the Main Turbine Control Valves repositioned in response to an Electro-Hydraulic Control (EHC) System speed signal anomaly. The Instrument Maintenance Department (IMD) had just completed replacing the intermediate pressure current to voltage (I/V) card which had been responsible for an unrelated problem that caused an EHC electrical malfunction alarm prior to the event. All equipment responded as designed. All Reactor Control Rods inserted, three of the Main Turbine Bypass Valves and no Safety Relief Valves cycled due to the low power level. The turbine generator tripped on reverse power following the reactor scram.

An EHC electrical malfunction alarm had been up solid due to the aforementioned intermediate pressure I/V card failure. This solid alarm masked the malfunction alarm produced when the back-up acceleration amplifier takes control of the turbine speed circuitry. At 1230, Operating informed the System Engineer that the turbine speed "increasing" light intermittently illuminated. This occurrence is not unusual prior to performing running checks on the speed circuits following synchronization of the unit. The immediate plan of action was to replace the intermediate pressure I/V card and then perform the speed circuit running checks per LaSalle Instrument Procedure LIP-EH-27, "EHC Running Checks".

At approximately 1430, Instrument Maintenance Department (IMD) personnel finished installing the I/V card and were confirming indicated pressures from the Control Room to be consistent with field indication when they were informed that the electrical malfunction alarm was chattering. This corresponded to the cycling of the back-up speed and acceleration amplifiers' indicating lamps flickering first rapidly, and then slowly at the EHC cabinet. The unit Licensed Nuclear Station Operator (NSO) telephoned the IMD Personnel at the cabinet to inform them that the main turbine bypass valves [TG] were cycling. The primary and secondary speed signals were then observed by using a digital voltmeter. The primary signal was found to be erratically indicating a slower speed than rated.

The back-up acceleration amplifier appeared to be taking control of the turbine speed for longer durations of time. Reactor pressure, which was originally 932 psig, was swinging from a low of 926 to a high of 940 psig. At this point, the reactor was manually scrammed by order of the Shift Engineer.

C. APPARENT CAUSE OF EVENT

The root cause of the speed signal anomaly has not been determined. The manual scram was initiated because of the excessive bypass valve cycling. An analysis of the events by Commonwealth Edison and the General Electric Company indicates that the erratic primary speed signal resulted in the EHC System switching from Load and Pressure Control to Speed Control and back again. The pressure increases and bypass valve cycling were responses to proper EHC Control System demand signals.

IMD had observed that the primary speed signal from the frequency to voltage converter was randomly dropping from its normal at speed signal of -10 volts. The back-up (b/u) signal was a solid -10 volts. This primary speed signal down-spiking allowed the back-up speed and acceleration amplifiers to take control of the speed signal.

The back-up low value gate, which houses the b/u speed and acceleration amps, is biased to take control of speed when the primary is inoperative. This bias creates a demand signal for an increase in speed that corresponds to a signal to open the control valves more when the b/u takes control. During testing and running checks, the changeover results in an increase in load when the back-up is selected. During the event, the continuous shifting between the primary and back-up low value gates resulted in a transient in which the Turbine Control Valves could not respond fast enough to maintain pressure. In response to the pressure transient, the bypass valves properly cycled open and closed to control pressure.

Following the turbine trip, the primary and back-up signals appeared to trend down together as speed decreased. The Transient Event Recorder did not trigger with bypass valve movement during the event so no data on valve positioning could be gathered.

D. SAFETY ANALYSIS OF EVENT

The safety significance of this event was minimal because the unit was at 18% power and well within the capacity of the Main Turbine Bypass Valves. No Emergency Core Cooling Systems (ECCS) were required to operate to control reactor pressure. The EHC System is Non-Safety Related.

E. CORRECTIVE ACTIONS

Insufficient operational data was obtained during the event and troubleshooting performed subsequent to the event, did not result in a determination of the specific cause of the speed signal anomaly. The speed circuits, as well as the outputs of the low value gate and bypass valve amplifier will be monitored by recorders set to trigger on recurrence of the spurious signal throughout the fuel cycle.

The IMD tested the cable integrity of the primary and back-up speed pick-ups from the front standard to the EHC cabinet terminal blocks. No failed components were identified. A test speed signal was applied to both circuits to identify failed circuit cards. Again, nothing was found out of tolerance or broken. An inspection of the speed pick-ups revealed that the primary pick-up gap was slightly wide, but not significant to cause an erratic signal. The gaps were reset and all connections cleaned.

An attempt to simulate the event by applying test speed signals revealed that a single failure of the primary speed signal could not exactly reproduce the observed anomaly. The primary and secondary speed circuits had been replaced following a similar speed anomaly on 9/24/91, but were only tested after this event.

E. CORRECTIVE ACTIONS (CONTINUED)

The Transient Event Recorder was tested and verified operational prior to the unit start up. The speed signals are being monitored and recorded for abnormal operation under Temporary System Change # 2-740-92, which will be closed following the present fuel cycle.

F. PREVIOUS EVENTS

None.

G. COMPONENT FAILURE DATA

None.